COMPACT 700 SERIES
ENCODERS FOR DRIVES
An encoder is mounted at the rear of a motor and therefore affects the motor’s overall length. In tight spaces, the build length can be restricted. Leine & Linde’s 700 series is designed to be as short as possible without compromising with the robustness.

Compact design
The 700 series is compact and robust. The series features large hollow shafts up to 30 mm, which means that it can often be mounted directly on the motor’s shaft without an intermediate adapter for shaft reduction. This characteristic contributes to minimising the overall build length, and at the same time facilitates mounting. Despite its compactness, the encoder is designed for the tough environments where a typical Leine & Linde product is used. Mechanically it features a dual set of heavy duty bearings and a well-encapsulated enclosure. Electronically it is built for reliability in tough environments where it is subjected to vibrations and electrical disturbances.

Modularity
Leine & Linde has a wide range of electrical interfaces to choose among – there is always a solution optimised for the particular application where the encoder is needed. The signals can consist of square waves, sine waves or even be optical with the help of a gateway for OptoLink transmission.

On the mechanical side, there is a multitude of different shaft variants that cover the market’s standards for both inch- and millimetre-based dimensions.
Modularity

Electronics
Output interfaces (supply voltage):
- HTL (5-30 Vdc)
- HCHTL (9-30 Vdc)
- TTL (5 Vdc)
- RS422 (9-30 Vdc)
- 1 Vpp (5 Vdc)

Resolution
Incremental pulses per revolution:
- 10 ppr
- 50 ppr
- 100 ppr
- 150 ppr
- 200 ppr
- 256 ppr
- 300 ppr
- 360 ppr
- 400 ppr
- 500 ppr
- 512 ppr
- 600 ppr
- 720 ppr
- 800 ppr
- 900 ppr
- 1000 ppr
- 1024 ppr
- 1200 ppr
- 1250 ppr
- 1600 ppr
- 2000 ppr
- 2048 ppr
- 2400 ppr
- 2500 ppr
- 3072 ppr
- 4096 ppr
- 4800 ppr
- 5000 ppr
- 6350 ppr
- 8192 ppr
- 10000 ppr

Flange
- Torque bracket (120º)
- Tether arm (with insulation)

Shaft
Through-going hollow shafts with insulation:
- Ø25 mm
- Ø20 mm
- Ø16 mm
- Ø14 mm
- Ø12 mm
- Optional Ø10 mm (without insulation)

Connection
- M23 connector 12 pin (CCW)
- MS connector 10 pin
- MS connector 7 pin
- Cable (free length)
Mechanics

This page offers an overview of the different mechanical variants available in the 700 series. Other variants can be created according to the code key on page 9.

- **Model CHI 703 with torque bracket and 10 pin MS connector**

- **Model CHI 703 with tether arm and 7 pin MS connector**

- **Model CHI 703 with torque bracket and 12 pin M23 connector**

- **Model CHI 703 with tether arm and 12 pin M23 connector**

- **Model CHI 703 with torque bracket and cable**
**Electronics**

### Square wave signals

<table>
<thead>
<tr>
<th>Interface</th>
<th>TTL</th>
<th>RS422</th>
<th>HTL</th>
<th>HCHTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>5 Vdc</td>
<td>9-30 Vdc</td>
<td>5-30 Vdc</td>
<td>9-30 Vdc</td>
</tr>
<tr>
<td>Output signal</td>
<td>5 Vdc</td>
<td>9-30 Vdc</td>
<td>5-30 Vdc</td>
<td>9-30 Vdc</td>
</tr>
<tr>
<td>Suitable for</td>
<td>Low frequencies over short cables</td>
<td>High frequencies over long cables</td>
<td>High frequencies over medium-length cables</td>
<td>Medium frequencies over long cables</td>
</tr>
<tr>
<td>Max frequency</td>
<td>200 kHz</td>
<td>200 kHz</td>
<td>200 kHz</td>
<td>200 kHz</td>
</tr>
<tr>
<td>Max cable length</td>
<td>50 m at 50 kHz</td>
<td>1000 m (TIA/EIA-422-B)</td>
<td>100 m at 100 kHz</td>
<td>350 m at 100 kHz</td>
</tr>
</tbody>
</table>

### Sine wave signals

Sine waves are an alternative form of output signal. The analogue signal produces a unique amplitude for each position on the wave, allowing interpolation and very high resolutions. The interface 1 Vpp is often used in safety-critical applications where detection are required of extremely small movements.

**Code key**

### CHI 703

- **Model**
  - 703 = Standard

- **Shaft**
  - 12 = Ø12 mm through-going hollow shaft
  - 14 = Ø14 mm through-going hollow shaft
  - 16 = Ø16 mm through-going hollow shaft
  - 20 = Ø20 mm through-going hollow shaft
  - 25 = Ø25 mm through-going hollow shaft
  - 01 = Ø11 inch through-going hollow shaft
  - 58 = Ø5/8 inch through-going hollow shaft
  - 34 = Ø3/4 inch through-going hollow shaft

- **Flange**
  - 0 = Without torque bracket
  - 2 = Torque bracket 120°
  - 9 = Tether arm with insulation

- **Electronics**
  - 1 = TTL (supply 5 Vdc, output 5 Vdc)
  - 5 = HCHTL (supply 9-30 Vdc, output 9-30 Vdc)
  - 6 = HTL (supply 5-30 Vdc, output 5-30 Vdc)
  - 7 = RS422 (supply 9-30 Vdc, output 5 Vdc)
  - 9 = Sinusoidal 1 Vpp (supply 5 Vdc, output 1 Vpp)

- **Connection**
  - 2 = M23 connector 12 pin (CCW)
  - 7 = MS connector 7 pin
  - 8 = MS connector 10 pin
  - 9 = Cable (specify length upon order)

- **Resolution**
  - 10, 50, 100, 150, 200, 256, 300, 360, 400, 500, 512, 640, 720, 800, 900, 1000, 1024, 1200, 1250, 1800, 2048, 2400, 2500, 3072, 4096, 4800, 5100, 6144, 10000 ppr
  - Sinusoidal 1 Vpp: 1024, 2048 ppr

Other resolutions available upon request.
### Technical data (based on HCHTL interface)

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>-40...+85 °C *</td>
</tr>
<tr>
<td>Ingress protection class (IEC 60529)</td>
<td>IP67 (IP65 at shaft inlet)</td>
</tr>
<tr>
<td>Vibration (IEC 60068-2-6)</td>
<td>≥ 200 m/s²</td>
</tr>
<tr>
<td>Shock (IEC 60068-2-27)</td>
<td>≤ 1500 m/s²</td>
</tr>
<tr>
<td>Cover material</td>
<td>Aluminum (anodized)</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 1000 g</td>
</tr>
<tr>
<td>Shaft load (axial / radial)</td>
<td>50 N / 100 N</td>
</tr>
<tr>
<td>Rotational speed max</td>
<td>6000 rpm</td>
</tr>
<tr>
<td>Shaft material</td>
<td>Stainless steel with insulated peek insert</td>
</tr>
<tr>
<td>Short circuit protected</td>
<td>Yes</td>
</tr>
<tr>
<td>Polarity protected</td>
<td>Yes</td>
</tr>
<tr>
<td>Current consumption</td>
<td>60 mA at 24 Vdc (max. 80 mA)</td>
</tr>
<tr>
<td>Output load</td>
<td>≥ 40 mA</td>
</tr>
<tr>
<td>Output frequency max</td>
<td>200 kHz</td>
</tr>
<tr>
<td>Cable length max</td>
<td>350 m at 100 kHz</td>
</tr>
<tr>
<td>Channel separation</td>
<td>90° el ± 25° el</td>
</tr>
<tr>
<td>Dividing error</td>
<td>± 50° el</td>
</tr>
</tbody>
</table>

* Available variants up to +100 °C

### Accessories

<table>
<thead>
<tr>
<th>Mounting accessories</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque arm M6</td>
<td>01208014 (specify length upon order)</td>
</tr>
<tr>
<td>Mating connector 7 pin MS</td>
<td>00201020</td>
</tr>
<tr>
<td>Mating connector 10 pin MS</td>
<td>00201012</td>
</tr>
<tr>
<td>Mating connector M23 (CW pin layout for CCW encoder connector)</td>
<td>01209090</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gateways and modules</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overspeed module, programmable, 0-6000 rpm</td>
<td>10680408-01</td>
</tr>
<tr>
<td>CRG OptoLink Transmitter, 9-30 Vdc supply, HTL input</td>
<td>01300520</td>
</tr>
<tr>
<td>CRG OptoLink Receiver, 9-30 Vdc supply, HTL output</td>
<td>01300330</td>
</tr>
<tr>
<td>CRG OptoLink Receiver, 9-30 Vdc supply, RS422 output</td>
<td>01300332</td>
</tr>
<tr>
<td>DM Converter, HTL or RS422 input, HTL and/or RS422 output signals</td>
<td>1110494-01</td>
</tr>
</tbody>
</table>

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Leine & Linde’s worldwide presence. Read more at www.leinelinde.com
The best encoders are those you never have to think about. Those that simply do their job – year after year. Leine & Linde develops and manufactures customised encoder solutions for demanding environments, advanced measuring systems for accurate feedback of speed and position.